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(19) (CA) **CANADIAN PATENT** (12)

(54) DISINFECTANT CLEANER COMPOSITION

(72) Dann, Thomas W.;  
Sgaramella, Peter,  
U.S.A.

(73) Granted to American Cyanamid Company  
U.S.A.

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**Canada**

DISINFECTANT CLEANER COMPOSITION

The present invention relates generally to pine oil-containing disinfectant cleaners and particularly to such cleaners which contain a very small amount of pine oil but nevertheless exhibit excellent germicidal activity against gram negative organisms. Such activity is due to the fortification of such cleaners with alpha terpineol.

Cleaning compositions containing pine oil as the active germicidal ingredient are well known and have a wide variety of household, institutional and janitorial uses (see, for example, Pine Oil Formulary, Section B, Pine and Paper Chemicals Dept., Hercules, I.C., p. 13-42). However, in order for such compositions to exhibit acceptable germicidal effectiveness against gram negative organisms, either a large amount of pine oil must be used, or one or more additional bactericidal components effective against gram negative organisms must be incorporated into the formulation.

Large amounts of pine oil in these compositions, however, result in a residue being left on the treated surface. Such a residue is undesirable in that it imparts a slippery feeling to the surface and also acts as a dust attractant. Further, pine oil is toxic. The quaternary ammonium and phenolic compounds which have heretofore been employed as the additional bactericidal components are also highly toxic irritants and create a strong odor and stability problems. Therefore, compositions containing either of these compounds are likewise not particularly desirable as consumer products.

It is accordingly an object of the instant inven-



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tion to provide a low level pine oil containing composition which possesses excellent bactericidal activity against gram negative organisms.

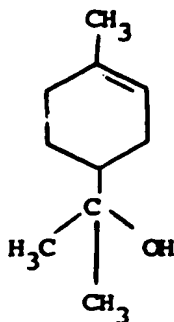
It is another object of this invention to provide such a composition which has good consumer appeal due to the fact that it retains the characteristic piny scent of pine oil containing compositions.

It is still a further object of the invention to provide such a composition which possesses good stability.

Other objects and advantages of the invention will become apparent from the ensuing description.

10

It has been discovered that when the amount of pine oil in a pine oil containing composition is substantially reduced, and sufficient alpha terpineol, a compound having the formula:



is incorporated into the composition, the composition possesses excellent bactericidal activity against gram negative organisms. In addition, such a composition retains a pleasant pine odor (the alpha terpineol actually contributes to the piny scent), is relatively easily stabilized, and is less toxic.

20

Accordingly, the present invention provides a disinfectant cleaner composition comprising (1) about 0 to 8 percent, by weight, pine oil; (2) sufficient alpha terpineol such that the total alpha terpineol content of the composition is at least 5.6 percent, by weight; (3) about 5 to 12 percent, by weight, of a nonionic or anionic surfactant; (4) about 6 to 12 percent, by weight, of a stabilizer; and (5) water.

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In accordance with the present invention, the pine oil content of the composition may be reduced such that it is present in an amount of about 1 to 8 percent, by weight, of the composition. Preferably, pine oil comprises about 3 to 7 percent of the composition. It is also within the scope of the invention to remove all of the pine oil from the composition. However, it is to be noted that when pine oil is completely removed from the composition, the strong pine scent is not present. A piny odor does remain, due to

the presence of the alpha terpineol, but it is weaker.

5 The alpha terpineol is present in the composition  
in an amount such that the total weight percent of it is not  
less than 5.6 percent. It being well known that alpha ter-  
pineol is a principal component of pine oil, achieving this  
critical weight percentage of alpha terpineol can be accom-  
plished in one of three ways. First, pine oils having alpha  
10 terpineol contents of 70% and higher are readily commercial-  
ly available and an amount of such a pine oil sufficient to  
yield an alpha terpineol level of 5.6 percent can be incor-  
porated into the composition. (For example, Glidco Pine Oil  
150, made by SCM Glidden Organics, typically contains about  
75% alpha terpineol. Having Glidco Pine Oil 150 present in  
the composition in an amount equal to 7.5% will result in an  
15 alpha terpineol content of just over the critical 5.6 percent  
level. Second, a smaller amount of pine oil (with a corres-  
pondingly smaller amount of pure alpha terpineol) may be add-  
ed to the composition, and an amount of pure alpha terpineol,  
which is readily commercially available, is then added such  
20 that the total alpha terpineol content of the composition is  
not less than 5.6 percent. Finally, the pine oil may be elim-  
inated from the composition altogether, and at least 5.6 per-  
cent of pure alpha terpineol is added. In this last case,  
however, the piny scent will not be as strong, as previously  
25 noted.

As stated above, the present invention's composi-  
tion is easily stabilized. To this end, lower alkyl alcohols  
and glycol compounds, such as propylene glycol and hexylene  
glycol, are employed. A preferred stabilizer is isopropyl  
30 alcohol. The stabilizer is present in an amount sufficient  
to stabilize the composition. Generally, from about 6 to 12  
percent, by weight, of the stabilizer is used. Preferably,  
the stabilizer comprises from about 8 to 10 percent of the  
composition. In large part, however, the amount of stabili-  
35 zer required in a given formulation will depend upon the  
types and kinds of the remaining ingredients in the composi-  
tion and the optimum type and amount of stabilizer to be used  
in a given system is best determined by routine experimenta-

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tion.

A surfactant is also present in the composition to aid in soil removal. Any conventional nonionic or anionic surfactant or surfactant system (all of which are well known in the art) may be employed, with the caveat again being that routine experimentation would yield the optimum surfactant for a given formulation. Examples of non-ionic surfactants include ethoxylated alkyl phenols. Typical anionic surfactants include alkali metal dodecyl benzyl sulfonates. Preferred surfactant systems are any of the  $C_{12}$  to  $C_{18}$  fatty acids or a combination of more than one such acid, and potassium hydroxide. The surfactant is generally present in the composition in an amount of about 5 to 12, preferably 6 to 8, percent by weight.

Optionally, ethylene diamine tetraacetic acid (EDTA) or a derivative thereof is incorporated into the composition, thereby further enhancing the germicidal activity of the formulation. Although applicants do not want to be bound by any theory, it is believed that the EDTA (or derivative) acts upon the cell wall of the gram negative organism in such a way that it is more easily penetrated by the active ingredients.

Preferably, the composition is adjusted to a pH of about 9 to 11, preferably 9.5 to 10.5. Should such an adjustment be necessary, it is typically made by addition of an alkali, such as potassium or sodium hydroxide.

The remainder of the composition is comprised of water, although additional ingredients, such as dyes, brighteners and the like may be incorporated without departing from the scope of the invention.

The following examples are illustrative of the present invention but are not to be construed in any way as a limitation thereof. All parts and percentages are by weight unless otherwise indicated.

Examples 1 - 3

Stable compositions with a pin odor were prepared having ingredients as follows:

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Example	Pine Oil*	Alpha Terpineol	Stabilizer**	Surfactant***	Dyes and Water
1	8.0	2.0	9.1	7.125	q.s. to 100
2	6.0	3.0	9.1	7.125	"
3	4.0	4.0	9.1	7.125	"

Note:

\* As Glidco Pine Oil 60, made by SCM Glidden Organics, containing about 45% alpha terpineol

\*\* Isopropanol

\*\*\* A mixture of tall oil fatty acid and KOH in a ratio of about 5.5:1, the KOH being present as a 45% solution.

Example 4

The compositions of Examples 1, 2 and 3 were tested for efficacy in killing gram negative organisms using the Association of Official Analytical Chemists (A.O.A.C.) Use-Dilution Test, which appears in the A.O.A.C. Methods manual, 13th edition (1980). The test is the official test method recognized by the U.S. Environmental Protection Agency (EPA) for registration and regulation of germicidal compositions for disinfectant activity. The gram negative test organism employed was Salmonella choleraesuis. Results of the A.O.A.C. Use-Dilution Test for the compositions of Examples 1-3, wherein each composition was diluted as shown, are set forth in Table 1 below. A score of 59/60 or 60/60 is considered a passing score.

TABLE I

Example Product	Dilution (parts product: parts water)	Results
1	1:32	60/60
1	1:64	60/60
2	1:64	59/60
3	1:64	59/60

\* No organic load was present.

It is seen that all these compositions were effective in killing gram negative organisms.

Example 5

A composition is prepared as follows:

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	<u>Weight Percent</u>
Pine Oil*	1.0
Alpha Terpineol	6.0
Stabilizer**	8.0
Surfactant***	8.0
Dyes and water	q.s. to 100

5      \*As Glidco Pine Oil 60, containing 45% alpha terpineol  
 \*\*Propylene glycol  
 \*\*\*Sodium dodecylbenzyl sulfonate.

The composition is stable, has a piny odor, and is effective in killing gram negative organisms.

10      Example 6

A composition is prepared as follows:

	<u>Weight Percent</u>
Alpha Terpineol	7.0
Stabilizer*	10.0
Surfactant**	8.5
Dyes, Brighteners and Water	q.s. to 100

15      \* Ethanol

\*\* Triton X 100, an octyl phenol having about 9 moles of condensed ethylene oxide, made by Rohm & Haas.

20      The composition is stable, has a piny scent which is not quite as pronounced as that of the composition of Example 5, and is effective in killing gram negative organisms.

Examples 7 - 9

25      Stable compositions, having a pine odor, were prepared having the following ingredients:

	7	8	9
Glidco Pine Oil 60 (45% alpha terpineol)	4.0	-	-
Terpineol 350 (100% alpha terpineol) made by SCM Glidden Organics	4.0	-	-
30      Glidco Pine Oil 150 (75% alpha terpineol)	-	8.0	-
Glidco Pine Oil 75 (75% alpha terpineol) made by SCM Glidden Organics	-	-	8.0
Tetrasodium EDTA	1.0	1.0	1.0
Isopropyl Alcohol	9.1	9.1	9.1
Tall oil fatty acid	6.0	6.0	6.0
35      45% KOH	2.2	2.2	2.2
Dyes and water	qs to 100	qs to 100	qs to 100

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Example 10

The compositions of Examples 7, 8 and 9 were evaluated for efficacy in killing gram negative organisms using the aforementioned A.O.A.C. Use-Dilution Test. In the testing, one part of each of the compositions was diluted with 64 parts water. The results are set forth in Table II below.

TABLE II\*

	<u>Example Product</u>	<u>Results</u>
10	7	59/60
	8	59/60
	9	60/60

\* No organic load was present.

It is seen that all three compositions were effective in killing gram negative organisms.

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WHAT IS CLAIMED IS:

1. A disinfectant cleaner composition comprising (1) about 0 to 8 percent, by weight, pine oil; (2) sufficient alpha terpineol such that the total alpha terpineol content of the composition is at least 5.6 percent, by weight; (3) about 5 to 12 percent, by weight, of a non-ionic or anionic surfactant; (4) about 6 to 12 percent, by weight, of a stabilizer; and (5) water.
2. The composition of Claim 1 further comprising about 0.05 to 2.0 percent, by weight, ethylenediamine tetraacetic acid or a derivative thereof.
3. The composition of Claim 1 or Claim 2 wherein the surfactant is a mixture of a  $C_{12}$ - $C_{18}$  fatty acid, or a combination of more than one such acid, and potassium hydroxide.
4. The composition of Claim 1, Claim 2 or Claim 3 wherein the stabilizer is isopropanol or ethanol.
5. The composition of Claim 1 wherein pine oil comprises about 3 to 7 percent, by weight, the surfactant comprises about 6 to 8 percent, and the stabilizer comprises about 8 to 10 percent.
6. The composition of Claim 5 further comprising about 0.5 to 1.0 percent, by weight, ethylenediamine tetraacetic acid or a derivative thereof.
7. The composition of Claim 1, Claim 2, Claim 5 or Claim 6 wherein the pH is adjusted to between about 9 and 11.
8. The composition of Claim 1, Claim 2, Claim 5 or Claim 6 wherein the pH is adjusted to between about 9.5 and 10.5.

Smart & Biggar  
Ottawa, Canada  
Patent Agents

